Resurrection Creek Stream Restoration Project
End of Construction Season Progress Report
September 2005

Heavy equipment construction work on the Resurrection Creek Stream Restoration Project for this year extended from May 17 through July 13, 2005. With this year's funding we were able to complete about three quarters of the heavy equipment construction work for the one mile long stream restoration project. We plan to complete the remaining construction work in the spring/summer of 2006.

Project construction accomplishments for 2005 include:

- ***Redistributing approximately 120,000 cubic yards of mine tailings*** to develop a new stream channel and floodplain
- ***Excavating, shaping, and "stepping" approximately 0.9 miles of new stream channel*** with natural pool/riffle/glide sequences, increasing the channel length by approximately 30 percent.
- ***Shaping 40 acres of floodplain*** to accommodate overbank flows but not allow for flood cut-off of newly created meanders.
- ***Constructing one mile of new side sloughs and ponds*** adjacent to, and on both sides of, the new stream channel. These side sloughs provide a "relief valve" to avoid erosion of the main channel during overbank flooding. The side sloughs and ponds provide high quality rearing habitat for salmon and trout fry. They were designed to maintain water flow through the full range of flow stages on the main channel. An additional 0.8 miles of side sloughs are partially constructed and will be completed during next year's construction.
- ***Placing approximately 600 pieces of large wood into engineered log jams*** along the main channel. These jams allow for moderation of side slough flows, provide cover for spawning and rearing fish, provide a high quality nutrient supply for fish, and work to capture additional natural large wood during flooding. Dead spruce was harvested for use from 10 acres along a terrace adjacent to Resurrection Creek, reducing local fuel loading hazards.
- ***Hauling and spreading approximately 5000 cubic yards of soil and woody debris onto the newly created flood plains*** to enhance both natural revegetation and future hand planting.
- ***Constructing 0.35 miles on new road*** along the east side of Resurrection Creek to replace a mining access road formerly located on Resurrection Creek's floodplain.
- ***Constructing a 2.5 acres parking addition for the Resurrection Pass Trailhead by removing approximately 4,000 cubic yards of tailings.*** Tailings were used for requested fill on private lands adjacent to the project area.

Figure 1 displays the location of the newly constructed main channel and side sloughs segments overlayed over the former location of Resurrection and Palmer Creeks. Additionally, the figure displays the main channel and side sloughs to be constructed in 2006 in pink. More survey and design work is currently planned for this 2006 work. **Figure 1** also displays the location of the pre-existing road to lower Palmer Creek, and the section of new road relocated out of the floodplain. This relocated segment was constructed in 2005. At present both roads are usable. In 2006 we will obliterate the parallel segment of the preexisting road and incorporated it into the floodplain

Figure 2 is similar in concept to Figure 1 and shows a June 6, 2002 aerial photo of the Project Area. The mine tailings piles are readily apparent on this photograph as well as Resurrection Creek's straight, narrow, steep character, and lack of side channels. The right hand map in Figure 2 shows the same June 6, 2002 aerial photo, with recent (August 11, 2005) aerial photography of the newly constructed Resurrection Creek stream channel, floodplain, and side sloughs mapped onto it.

Figures 3 and 4 show parts of the construction sequence for Meanders 3 and 5. On each constructed meander, the channel was excavated in the dry. Using cross-channel ribs, riffles, pools, and glide segments were formed. Coarse channel substrate was laid in on riffle segments. When channel formation was completed, streamflows were diverted into the meander, and both tailings piles and excavated materials were pushed into the pre-existing channel. Floodplains and side sloughs were developed on both sides of the new channel. Floodplains were covered with soil and woody debris. Meander 5 was the last new meander completed in 2005.

Figure 5 shows a log jam built on Meander 3. This is one of 10 log jams constructed on the project. These jams are engineered and "keyed" deeply into the streambank making them largely resistant to flood impacts. The log jams work to collect additional woody debris, provide cover and nutrients to rearing fish, and on this project have been frequently used at the head of side sloughs to moderate flood flow volumes into the side slough while still allowing water flow during winter low flow conditions.

Figure 6 shows an 8/11/05 aerial photograph of one segment of newly reconstructed stream channel with over 100 pink salmon spawning in it. We counted over 1,000 pink salmon in the newly restored channel. This is an "off" year for Cook Inlet pinks. Larger numbers of pink spawners are likely to return in even years. In July we counted over 100 chinook salmon spawners in the restored reach, and by early September, over 100 coho spawners.

Work in 2006 will concentrate on completing the remaining main channels and side sloughs shown in Figure 1, and constructing their associated floodplains. We will also initiate revegetation efforts, working cooperatively with the Youth Restoration Corps. Revegetation work will focus particularly on planting willows and alders along the newly created side sloughs to provide cover for rearing fish, and on planting birch and spruce on the newly created floodplains. We expect abundant natural regeneration of cottonwoods from seed. Soil placed on floodplains in 2005 is showing rapid regeneration for grasses and forbs.

Figure 1 – May 15, 2002 Aerial Photo of Resurrection Creek Project Area With New and Proposed Construction Mapped On

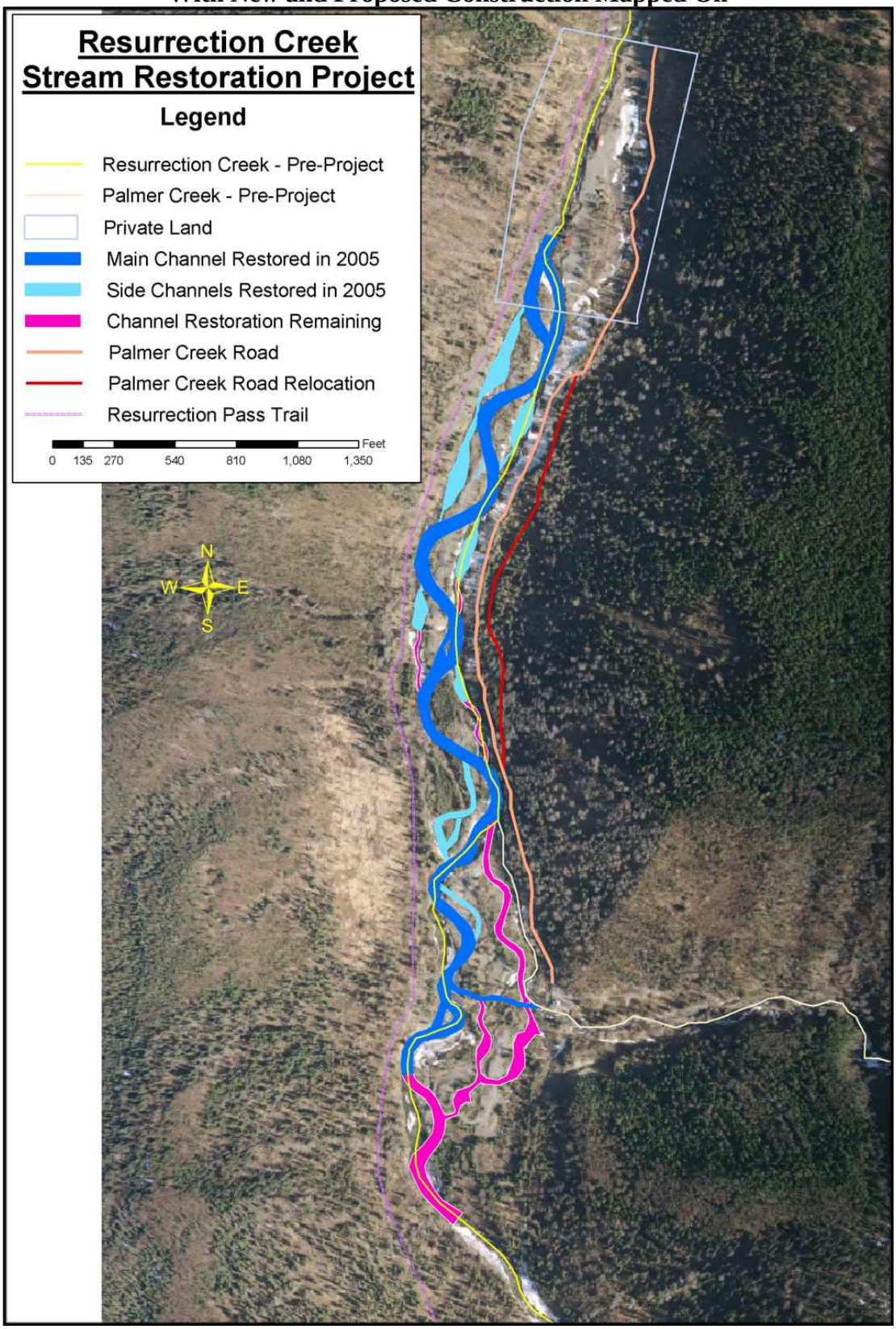

Figure 2 - 2002 Aerial Photo of the Resurrection Creek Restoration Project Area. Right Side Has Photography of the 2005 Restoration Work Overlaid

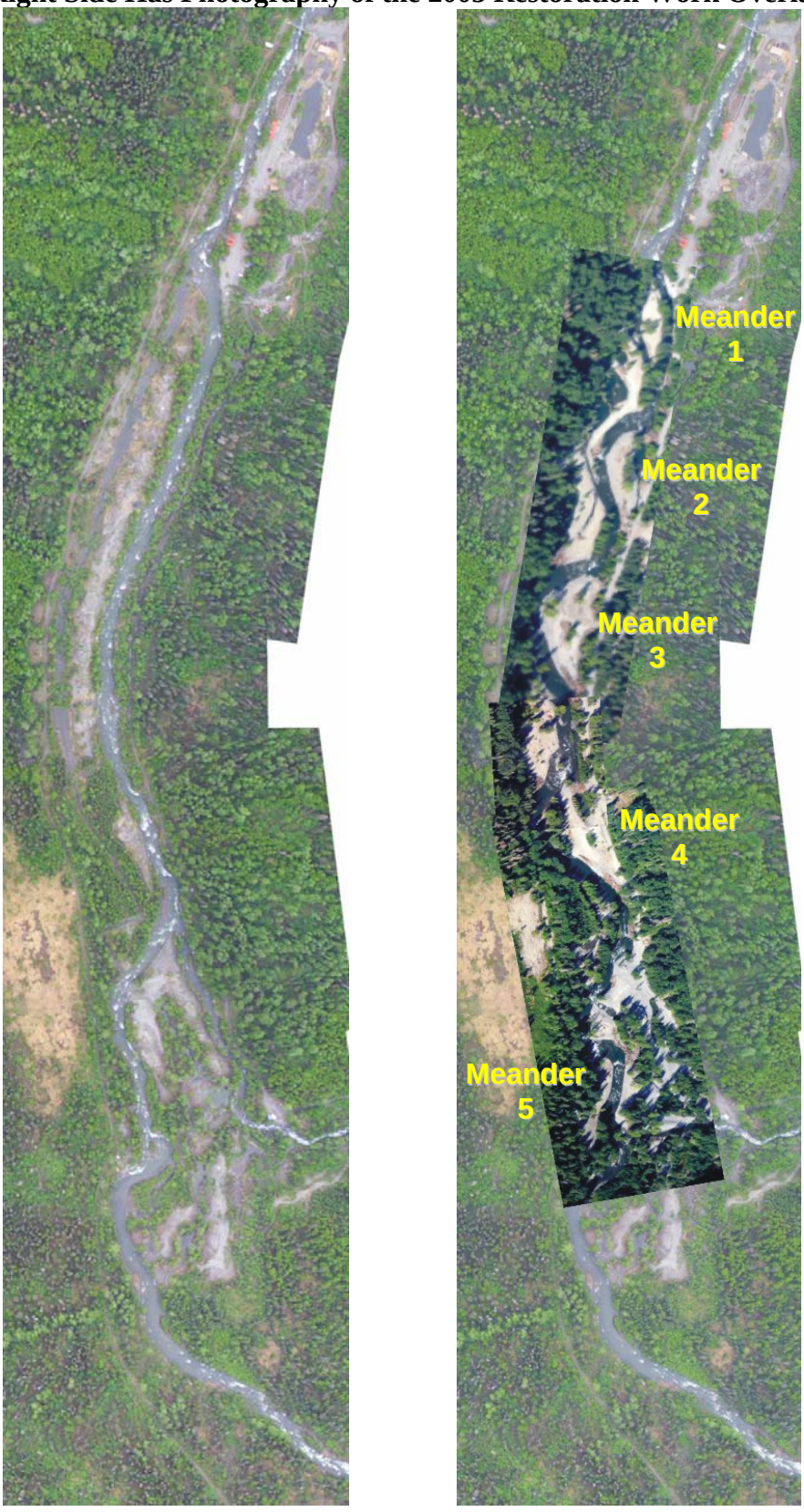

Figure 3 - "Meander 3" Construction Sequence (from the Resurrection Pass Trail)

May 6, 2005

May 25, 2005

May 31, 2005

June 28, 2005

July 21, 2005

Figure 4 - “Meander 5” Construction Sequence

7/5/05

7/7/05

7/9/05

7/11/05

7/14/05

Figure 5- Engineered Log Jam at the Upper End of "Meander 3"

Figure 6 – Some of the over 1,000 Pink Salmon Spawning on the Newly Restored Stream Reach, August 11, 2005